International Journal for the Scholarship of Teaching and Learning

Volume 4 | Number 2 Article 10

7-2010

The "Classroom Ticket" to Concept Retention

Kent Divoll
divoll@uhcl.edu, divoll@uhcl.edu

Sandra Browning
browning@uhcl.edu

Recommended Citation
Divoll, Kent and Browning, Sandra (2010) "The "Classroom Ticket" to Concept Retention," *International Journal for the Scholarship of Teaching and Learning*: Vol. 4: No. 2, Article 10.
Available at: https://doi.org/10.20429/ijsotl.2010.040210

The "Classroom Ticket" to Concept Retention

Abstract
Classroom assessment techniques have been advocated for use in the college classroom for over 20 years. The authors of this paper formed a new teaching technique, the ticket to retention (TtR), one that changes classroom assessment techniques so that the emphasis is on student retention of concepts. This technique combines the benefits of the ticket to leave, the one minute paper, the half-sheet response, the post-write strategy, and think-pair-share strategies. During the TtR technique, a sheet with one to five target questions is distributed to students. Students write their answers to the questions, discuss their responses with two classmates,a nd listen to those classmates share their answers. The results of this mixed methods study provide the students and professors' perspective of the ticket to retention and a percentage of information that students recall as a result of the implementation fo the ticket (89%).

Keywords
Classroom assessment techniques, Student retention, Student learning, College teaching

The "Classroom Ticket" to Concept Retention

Kent Divoll
University of Houston-Clear Lake
Houston, Texas, USA
divoll@uhcl.edu

Sandra Browning University of Houston-Clear Lake Houston, Texas, USA browning@uhcl.edu

Abstract

Keywords: classroom assessment techniques, student retention, student learning, college teaching.

Classroom assessment techniques have been advocated for use in the college classroom for over 20 years. The authors of this paper formed a new teaching technique, *the ticket to retention (TtR)*, one that changes classroom assessment techniques so that the emphasis is on student retention of concepts. This technique combines the benefits of the ticket to leave, the one minute paper, the half-sheet response, the post-write strategy, and think-pair-share strategies. During the TtR technique, a sheet with one to five target questions is distributed to students. Students write their answers to the questions, discuss their responses with two classmates, and listen to those classmates share their answers. The results of this mixed methods study provide the students and professors' perspective of the ticket to retention and a percentage of information that students recall as a result of the implementation of the ticket (89%).

Introduction

Currently, the role of a college professor is viewed as a transmitter of knowledge. A typical class operates with the professor providing information usually through lecture (Bligh, 1998; Lammers & Murphy, 2002) with the students taking notes. The authors of this paper support the need for a change in philosophy for college teaching. The assessment movement at the college level, which attempted to reframe the role of the professor to focus on student learning and course design (Angelo & Cross, 1993; Cross & Steadman, 1996; Huber & Hutchings, 2005), was a step in the right direction. However, we support a further shift, one that changes the role of a professor from transmitter of knowledge and assessor of learning to facilitator of learning (Barr & Tagg, 1995; Wlodkowski, 2008). This vision includes professors' implementation of teaching methods which can be used for assessment of student learning and course design, but are specifically designed to assist students in retaining concepts in long-term memory rather than simply memorizing for an exam.

https://doi.org/10.20429/ijsotl.2010.040210

Theoretical Framework

Some researchers (Angelo & Cross, 1993; Cross, 1998; Cross & Angelo, 1988; Light, 1990; McGlynn, 2001; Richlin, 1998; Steadman & Svinicki, 1998; Weaver & Cotrell, 1985; Wlodkowski, 2008) recommend the use of classroom assessment techniques or closure activities to encourage instructors to be reflective about their teaching. One such technique is the ticket to leave strategy which is used in classrooms from early elementary to high school (Research for Better Teachers, n.d.) and more recently used at the college level (Singleton & Newman, 2009). The ticket to leave is used to reinforce main points of a class session and to determine students' understanding of concepts presented (Research for Better Teachers, n.d.; Singleton & Newman, 2009). In a classroom setting, the ticket to leave includes students answering, in writing, one to five questions concerning the important concepts that were discussed during class. Usually completed at the end of class, the ticket is provided to the instructor before a student can leave the classroom or move to another subject.

The ticket to leave is similar to other classroom assessment techniques that have been promoted to check for students' understanding at the college level, such as the one minute paper (Angelo & Cross, 1993; Barkley, Cross, & Major, 2005; Cross & Angelo, 1988; Wilson, 1986), the post-write strategy (Allen & Roswell, 1989), and the half-sheet response (Weaver & Cotrell, 1985). The one minute paper, for example, assesses students' knowledge of concepts discussed in class and provides information to the instructor about areas in which students are confused. Usually student list some variation of the following two topics during the one minute paper: (a) concepts that they consider to be the most important and (b) areas of confusion. Research on the one minute paper has shown that it enhances student learning (Almer, Jones, & Moeckel, 1998; Chizmar & Ostrosky, 1998) and the students' perception that they are learning (Drummond, 2007). In fact, many classroom assessment techniques can be used to enhance student learning (Guskey, 2003; Taylor, Marienau, & Fiddler, 2000; Wiggins, 1998). The post-write strategy and the half sheet response are similar to the ticket to leave and the one minute paper since all four strategies involve students writing about the information covered during the session. These strategies are used to assess student understanding and can be used to determine if the professor was successful in transferring information to the students (Angelo & Cross, 1993; Cross & Angelo, 1988; Barkley et al., 2005; Research for Better Teachers, n.d.; Weaver & Cotrell, 1985; Wilson, 1986).

However, these techniques focus on assessment of student knowledge and evaluation of teaching with student retention as a byproduct. The assessment techniques are used to determine the students' areas of confusion so that the professor can clarify. Missing from literature concerning classroom assessment techniques is how such strategies can be adapted so that students' long term retention is a direct result of such methods. Sousa (2001) suggests that learning and retention are not the same and that learning does not necessarily result in long-term retention (Sousa, 2001). For example, one can learn information for a short period of time and then forget the information, such as a grocery list. Sousa defines retention as "the process whereby long-term memory preserves a learning in such a way that it can locate, identify, and retrieve it accurately in the future" (p. 85). If a student cannot recall information presented after 24 hours, the information "was not permanently stored and, thus, can never be recalled" (Sousa, 2001, p. 50).

The authors of this paper formed a new teaching technique, which we refer to as *the ticket to retention* (TtR), combining the benefits of the ticket to leave, the one minute paper, the

half-sheet response, the post-write strategy, and think-pair-share strategies (Kagan, 1994) (a technique that includes students thinking about a topic and discussing it with a partner). The TtR maintains the principles of assessing student learning and professor instruction, which are promoted in the aforementioned strategies, while emphasizing a focus on student retention. Wlodkowski (2008) states, "If we take an institutional perspective, the first aim of assessment is usually to audit adult learning. However, . . . assessment should primarily be used to enhance learning and motivation" (p. 314). The TtR achieves these goals, while improving student retention of instructional concepts. The TtR is different from other classroom assessment techniques in four significant ways. First, students are asked questions that specifically focus on the key concepts that the professor wants students to understand rather than vague questions such as what are three things that you learned today or what were the most important points from the lecture. By asking specific questions, the professor targets precise learning objectives that he/she recognizes as the important content that should be reinforced. In doing so, the primary focus of such technique shifts from assessment to student retention. Second, the TtR includes interacting with peers multiple times and active learning both of which are encouraged when teaching adults (Lawler, 1991). Third, the TtR supports the view of the professor as a facilitator of learning (Barr & Tagg, 1995) rather than the general perception of the professor as merely a provider of knowledge. Fourth, rather than simply have students write the answers to questions, our version involves methods which allow students to interact with the topics multiple times, in multiple modalities, in a short amount of time.

During the TtR technique, a sheet with the three to five target questions is distributed to students. Students write their answers to the questions, discuss their responses with a classmate, and listen to that classmate share his/her answers. The sharing and revising cycle is then repeated with another classmate. Finally, the written responses are collected by the professor. Since the focus is on retention, students are encouraged to use their class notes to answer the questions and revise their answers as needed when sharing with classmates. Using the TtR in this manner reinforces the main points by asking the students to think, write, explain, and listen. According to recent brain research, "there appears to be separate brain areas that specialize in subtasks such as hearing words (spoken language of others), seeing words (reading), speaking words (speech), and generating words (thinking with language)" (National Research Council, 2000, p. 122). Through writing, speaking, listening, and comparing, the TtR involves multiple areas of the brain. Additionally, the sharing and revising cycle provides a quick check for accuracy and an opportunity to clarify misconceptions concerning the targeted questions. Moreover, the TtR includes (a) reviewing material from the day, which as Cross (1981) suggests should be frequently done to encourage retention; (b) learning actively and student engagement which is recommended over a passive style and can result in student success (Flint, Zakos, & Frey, 2002; Grubb, 1999; Grubb & Byrd, 1999; Kuh, Kinzie, Schuh, Whitt, & associates, 2005; Meyers & Jones, 1993; Sorcinelli, 1991); (c) writing, which "can help assimilate new material into a network of existing knowledge" (Goodkin, 1981, p.1, as cited in McGlynn, 2001, p. 117); (d) stating their answers out loud, which Saphier and Gower (1997) suggest professors and teachers should be "aware of the power of having learners say their learning out loud, and get involved in using it to do something" (p. 254); and (e) adhering to aspects of social development theory (Vygotsky, 1978) which leads to higher-order thinking (Tharp & Gallimore, 1988).

The TtR encourages students to review the concepts discussed in class, reflect on the information, synthesize the concepts prior to leaving class, while addressing different learning styles. Learning is enhanced when information is presented in a format that

integrates learning styles (Felder, 1993). Our technique increases the likelihood that students will retain the information because the concepts will be reviewed at least seven different times in one session: (a) students will hear the information, (b) write it in their notes, (c) write it on the TtR sheet, (d) state the answers twice to someone, and (e) hear someone say each answer twice. By reinforcing the main concepts using the TtR, we assert that there is potential for students to store information into their long-term memories (Sousa, 2001).

Purpose

The purpose of this research study was five-fold: (a) to pilot an alternative to the classroom assessment techniques, (b) determine the student retention rates, (b) to compare the retention rates during a four-week summer semester and a 15-week fall semester, (c) to ascertain student perceptions of the TtR, and (d) to uncover any challenges of implementing the strategy.

Methods

The primary participants of the study were two college professors, who are also the authors of this paper, and their 59 undergraduate students. The setting for this mixed methods study included two four-week summer courses and three 15-week fall undergraduate college level classroom management courses at a southern university. Each professor taught one section of the course during the summer semester. Professor A taught three sections of the course during the fall semester. Professor B did not teach this course during the fall semester and therefore was not included in the fall data. During the four week semester, which included 15 Monday through Thursday two hour 50 minute sessions, professor A implemented the TtR strategy nine times and professor B employed the strategy seven times. During the 15-week fall semester, which included meeting weekly for two hours and 50 minutes, professor A used the TtR strategy ten times in each section.

A mixed methods research design was implemented because, as Johnson and Onwuegbuzie (2004) suggest, such methodology can “add insights and understanding that might be missed when only a single method is used” (p. 20). In our case, simply providing the retention rate does not provide the reader with enough information about the TtR. In addition, this study met all five of rationales for mixed methods research, i.e., triangulation, complementarily, initiation, development, and expansion (Green, Caracelli, & Graham, 1989). A mixed methods research design provided a way to triangulate the findings. Since the TtR attempts to change classroom assessment techniques and offers an alternative, the three data sources created a clear picture of the TtR (i.e., complementarily) and provided insight into numerical data (i.e., development and expansion) that otherwise would be missing in a quantitative design. Finally, we wanted to discuss areas of struggle for the professors and the students’ frustration with the TtR to help us reframe our research question for future research (i.e., initiation).

Data collection

Multiple data collection methods were used during this study. These data sources included (a) midterm examinations, (b) final examinations, (c) class discussion about the TtR (only during the fall semester courses), and (d) professor field notes. The midterm examination

consisted of short answer questions and the final examination consisted of multiple choice questions. The questions on the examinations included only concepts that were discussed in class and reinforced using the TtR strategy. The midterm was administered during the eighth class, while the final and student discussion were administered during the 15th class.

Data analysis

Data analysis methods included Onewuegbuzie and Teddlie's (2003) seven stages of analysis, i.e., data reduction, data display, data transformation, data correlation, data consolidation, data comparison, and data integration. We reviewed the class discussion and professor field notes to create categories and determine patterns, and then a constant comparative approach was used to discover evidence for the categories and patterns. In addition, the mean and the median of the mid-term and final were analyzed for each class, each professor, and each type of class (four week verses 15 week semester).

Results

Students in the two four-week summer courses and the three 15-week semester courses were all given a midterm and final examination. At the beginning of the semester, students were told that their grades were determined by papers and projects rather than examination. Therefore the midterm and final were given to the students with no advance warning and the students were told that the midterm and final were only to determine what they learned and would not count toward their grade. Since the students were given no advanced warning that there would be a midterm and final, most likely students did not study the material that was assessed on the midterm and final. Data were organized first by length of course (four-week courses followed by the 15-week course), then by section (one and two for the four-week course and 11, 12, and 13 for the 15-week course) and finally by the type of assessment (midterm followed by final). After each length of semester, a review of the results from that length will follow. Finally, data from the student discussions and teacher field notes will be included.

Four-Week Summer Courses

The four-week summer courses consisted of students (n=34) from two sections of the same course each taught by one of the authors of this paper. Section one consisted of 15 students and section two consisted of 19 students.

Section one midterm. The scores on the midterm for section one (n=15) ranged from 52 to 100. The mean score for the midterm for class one was 89.4, while the median score was 91. Section one had fourteen out of fifteen students receive a passing grade on the midterm, which resulted in 93.3% of the students passing. None of the students in this section had a score in the 60's and two students had a grade in the 70's (i.e., 76, 79). In other words, only three students, or 20%, did not score an 80 or above on the midterm. In fact, 10 out of the 15 students, or 66.7%, in section one scored above a 90 on the midterm (see Appendix).

Section one final. The range for the final exam for section 1 was from 74 to 97. The mean score for the final was 88.6, while the median score on the final was 89. All 15 of the students in section one passed the final with only three of the students, or 20%, scoring in the 70's (i.e., 74, 76, 79). Six of the 15 students in class, or 40%, scored above a 90 on the final.

Section two midterm. In section two (*n*=19), the range on the midterm was 52 to 100. The mean score for the midterm was 84.2, while the median grade was 87. In the second class two students failed and seventeen out of nineteen students score above a 70 resulting in 89.4% of the students passing. Three students had a grade in the 70's (i.e., 70, 78, 78) and no student had a score in the 60's. Only five students in the class, or 26.3%, did not score an 80 or above on the midterm. Eight out of 19 students, or 42.1%, in class two scored above a 90 on the midterm.

Section two final. The range for the final exam for the second class was from 72 to 97. The mean score for the second class on the final was 87.6, while the median score on the final was 87.6. Only three students, or 15.8%, scored below an 80. Six out of the 19 students, or 31.5%, scored in the 80's (i.e., 81, 84, 84, 84, 88, 88), while 10 out of 19 students, or 52.6%, scored above 90 on the final.

Summary of Summer Data

During the four week summer course students (*n*=34) scores on the midterm ranged from 52 to 100. The mean of the midterm grades for both classes was 87 and the median was 91. Three of the 34 students failed the midterm, with the remainder of the students earning a 70 or above. The summer midterm resulted in 26 of 34 students, or 76%, earning an 80 or above and 18 students, or 53%, earning a grade above a 90. The scores on the final ranged from 72 to 97; thus, no students failed the final. Six of the 34 students, or 18%, earned scores in the 70's on the final, while 16 of the students, or 47%, earned above a 90. The mean of the final for both summer sections was 88 and the median was 89.

15-Week Courses

There were three sections of the fifteen week course. Each was taught by the same professor, one of the authors of this paper. This professor also taught section one during the summer.

Section 11 midterm. In section 11 (*n=4*), the range on the midterm was 67 to 82. The mean score for the midterm was 76, while the median grade was 71. Section 11 had three out of four students score a 75 or above on the midterm and 100% of the students achieve a passing grade. Two students had a grade in the 80's (i.e., 81, 82), one student scored in the 70's (i.e., 75), and one student scored in the 60's (i.e., 65).

Section 11 final. The range for the final exam for section two was from 87 to 97. The mean score for section 11 on the final was 91, while the median score on the final was 89. Three of the four students earned a grade in the high eighties (i.e., 87, 89, 89) on the final.

Section 12 midterm. In section 12 (*n=11*), the range on the midterm was 67 to 100. The mean score for the midterm was 90, while the median grade was 95. Section 12 had ten 10 out of 11, or approximately 91%, score a 70 or higher on the midterm. One student earned a score in the 60's (i.e., 67), one scored in the 70's (i.e., 71), and two in the 80's (i.e., 86, 86). Seven students, or approximately 64%, achieved a score above a 90 (i.e., 92, 95, 95, 98, 98, 98, 100).

Section 12 final. The scores on the final for section 12 ranged from 76 to 97. The mean score for the final was 87, while the median score was 84. Section 12 had two students receive a grade in the 70's (i.e., 76, 79) and four students earn a grade in the 80's (i.e., 82, 82, 84, 84). Five out of eleven students, or 45%, received above a 90 (i.e., 92, 92, 92, 97, 97) on the final.

Section 13 midterm. Section 13 (*n*=10) consisted of a range on the midterm from 79 to 100. The mean score on the midterm was 92, while the median grade was 93. Section 13 had 9 of 10 students, or 90%, score 80 or higher on the midterm (i.e., 81, 86, 93, 93, 93, 95, 100, 100, 100). One student earned a score in the high 70's (i.e., 79).

Section 13 final. On the final, the scores for section 13 ranged 76 to 95. The mean score on the final was 87, while the median grade was 87. Two students scored in the 70's (i.e., 76, 76). Eight of ten students, or 80%, scored above an 80. Four students achieved scores in the 80's (i.e., 82, 84, 87, 87) and four students earned grades in the 90's (i.e., 92, 92, 95, 95).

Summary of 15-week Data

During the three sections of the 15-week semester long courses students (*n=25*) scores on the midterm ranged from 67 to 100. The mean of the midterm grades for the classes was 88 and the median was 93. None of the 25 students failed the midterm and only two students scored below a 70 (i.e., 67, 67). In fact, only three students earned grades in the 70's (71, 75, 79). Therefore, 20 out of 25 students, or 80%, earned above 80 and 14 students, or 56%, scored above a 90. The scores on the finals ranged from 76 to 97; consequently none of the students failed the final either. Four of the 25 students, or 16%, earned scores in the 70's on the final, while 10 of the 25 students, or 40%, earned above a 90. The mean of the finals was 88 and the median was 89.

Summary of Midterm and Final Grades

The midterm students' (*n*=59) grades between the four and 15-week courses ranged from 52 to 100 and 72 to 97 on the final. The mean score on the midterm across all sections was 87 while the mean for the final was 88. The median score for all midterms was 91, while the median score on the final was 89. Overall, only three students failed the midterm (all three were from the four-week summer courses) and none of the students failed the final regardless of the type of class. Of the 59 students 32, or 54%, earned a 90 or above on the midterm and 26, or 44%, scored a 90 or above on the final (see Table 1).

Table 1

Mean/Median Scores on Assessments

		Midterm			Final		
		Range of Grades	**Mean**	**Median**	**Range of Grades**	**Mean**	**Median**
Summer 2009	Section 1	52-100	89	91	74-97	89	89
	Section 2	52-100	84	87	72-97	88	88
Total Summer		52-100	87	91	72-97	88	89
Fall 2009	Section 11	67-82	76	71	87-97	81	89
	Section 12	67-100	90	95	76-97	87	84
	Section 13	79-100	92	93	75-95	87	87
Total Fall		67-100	88	93	76-97	88	87
Total for All		52-100	87	91	72-97	88	89

Student Themes

When asked about their views of the TtR strategy three themes emerged that were consistent across all of the sections. First, the students encouraged the professors to start the strategy early enough in class so that the students could complete the activity before the end of class and not feel rushed to get to their next class. Students posited “I often show up late for my next class” (section 11 discussion), “We get out of class late” (section 12 discussion), and “Start earlier so we get out on time” (section 13 discussion). Students mentioned that many times professors provided instructions about assignments during the TtR. Students stated that they would miss important information about assignments. Comments included “When you talk about assignments during the TtR we miss important information that we need to know” (section 12 discussion) and “Don’t announce things during the TtR because we miss out” (section 13 discussion). Some students mentioned that running late, rushing the TtR, and providing instructions about assignments actually resulted in a stressful end to class: “Sometimes it stressed us out” (section 11 discussion). Second, the students suggested that they did recall more information than they would have without the TtR. The common theme was that they “enjoyed the TtR because it really helped to learn information and share ideas” (section 12 discussion) and “I remembered more” (section 13 discussion). Third, students enjoyed using class time to discuss and share their answers with their classmates. Many students suggested that few classes provide time for them to interact with their peers; “We got to interact with our classmates, that never happens in some classes” (section 13 discussion).

Professor Themes

Over the two types of semesters of implementing the TtR, we noted a few important points about using the strategy. First, we forced students to stay late to finish the TtR because we were trying to complete class activities. From our notes, we realized that we were not being fair to the students’ time nor were we providing a learning environment that allowed for the TtR to blossom. In a few of the sections, we actually had students ask if we could start the TtR strategy earlier because they were arriving late to their next class. Second, on occasion, we did not monitor the students’ use of the strategy because students were asking the professors questions or we were collecting our materials at the end of class. As has been suggested about group work, the students who are active participates in the activity tend to learn more (Lotan, 2006). Therefore, when we did not monitor the activities, the students might not have completed all of the process of the TtR and the TtR would not be as effective. Finally, we were concerned that the TtR strategy has the potential for students to reinforce incorrect information by writing, repeating their answers, and hearing others share incorrect answers. Yet, our field notes, the student scores, and the class discussion did not yield evidence of this.

Discussion

The findings indicated that the use of the TtR strategy resulted in high test scores on both the midterm and the final examinations. Both of the professors do not typically use a midterm or final, nor do they use weekly quizzes to assess students learning. The assessments for the course are paper and project based. The students were not alerted to the fact that there would be a midterm or final examination and when students were given these tests the students understood that the examinations would not count toward their grade. Therefore, the students had no real incentive to do their best on the exams nor did

they have time to study. Yet, the scores indicated that the students had, indeed, retained the concepts taught.

Reviewing concepts with students during a four week class and receiving a high rate of retention is not surprising because of daily meeting and short length of the class. However, the TtR strategy resulted in similar rates of retention regardless of whether the meetings were four times a week over four weeks or once a week over 15 weeks. The midterm and final examination that the students were given only assessed concepts that were reinforced using the TtR strategy. On average, based on the assessment scores, the students could recall between 87% (midterm mean) and 88% (final mean) of the information that was reviewed using our strategy. The high recall rates regardless of the length of times and number of times the students met a week seem to suggest that the TtR strategy results in students committing the concepts reinforced using this strategy to their long term memory (Sousa, 2001).

An interesting finding from the study was that the students' finals, regardless of whether the class was four weeks or 15, reflected that all of the students could recall a minimum of 72% of the key concepts (the lowest grade by a student on the final). This high recall percentage occurred despite the fact that students had no prior knowledge that an exam would be administered on the last day of the course. The final exam required students to answer multiple choice questions, while the midterm consisted of short answer questions. Despite the two types of assessments, the students were able to recall information at a high level. An interesting phenomenon resulted with the three students who failed the midterm; all three of the students passed the final. The students who failed the midterm (i.e., 52, 52, 57) all improved their scores on the final (+22 points, +26 points, and +27 points respectively). In addition, students who scored in the 60's and 70's on the midterm also improved their grades between five to 21 points on the final. We were surprised by this finding because one might assume that the students who did poorly on the midterm would score a similar or lower percentage on the final. The conclusions that we drew from the increased scores are that (a) the students who received low grades may have been more motivated as a result of the low grade, (b) these students may not have taken the TtR strategy seriously during the first part of the course, or (c) the information toward the end of the semester may have been easier for them.

One of our concerns with the TtR strategy was the potential for students to reinforce incorrect information by writing, repeating their answers, and hearing other share their answers. Although this could have resulted in a few students' incorrect answers, we did not see such evidence. In addition, although we did not check every TtR we collected, we found very few with incorrect responses. We concluded that this was the case because (a) students were encouraged to find the initial answers from their notes or if they could not find the concept in their notes to ask a classmate, (b) students knew they were accountable for what they wrote because we collected their written TtR, and (c) having discussed their ideas with two people decreased the chance of the students coming away with the incorrect answer, which is supported by high overall averages on the midterm and final. In fact, we both witnessed some students change or add to their written response after meeting with a partner.

Finally, as we learned from the students and our field notes, when using the TtR one must invest the time needed so that students will not feel rushed and stressed. However we must admit that, seeing the high retention rate of the information reviewed using the TtR, we regret not providing an appropriate amount of time at the end of some classes. Although we

were not surprised by the students' view that they enjoyed sharing with partners, we were pleased that the strategy resulted in increased retention and student enjoyment in only 10 minutes of a class period.

Conclusion

In today's college classroom, the Instruction Paradigm (Barr & Tagg, 1995) which predominately includes the use of a lecture style (Bligh, 1998; Lammers & Murphy, 2002; Wang & Farmer, 2008), seems to be the norm. Classroom assessment techniques or closure activities currently in use at the college level have begun the shift away from the Instruction Paradigm. However, we support a further shift that includes a focus on student retention and offer the TtR as a teaching technique to promote this shift. The TtR maintains the principles of assessing student learning and professor instruction, which are promoted in the aforementioned classroom assessment techniques, while incorporating a focus on student retention.

The results reported here offer the student and teacher perspective of implementing the TtR and a percentage of information that students retained as a result of implementing the TtR. Students recognized that the TtR increased the amount of information that they could recall. The professors found the TtR useful, but realized that on occasion the TtR was rushed at the end of class and not given the attention that it deserved. The statistical data offer insights into restructuring classroom assessment techniques to improve student retention, rather than simply to improve instruction. By using questions that directly focus on specific concepts, the students understand exactly what information is important from a class session. The direct questions, along with the added student interaction (i.e., having students write, explain the concept to two people, and hear concept from two people) resulted in a high level of retention. When the TtR strategy was employed, students tended to recall a large percentage (87-88%) of the information reinforced with the TtR. The TtR resulted in retention during a short interval (four weeks) and a longer period of time (15 weeks).

Given the aforementioned literature about aspects of the TtR, we assumed that student retention would occur. However, the high retention rate on the midterm and final exams for both lengths of semester were a pleasant surprise. Most surprising were high grades even though the midterm and final, in all classes and all both types of semesters, were not announced prior to their administration, nor were the scores part of the final course grade. One would assume that the retention rates would increase if students were given advance notice and the students were held accountable for the information by using the assessments toward their final grade.

Despite the high level of retention, the data report here is only preliminary and there are limitations to the study. Our first step to determining the effectiveness of the TtR was threefold: (a) to investigate whether the TtR resulted in the student retention over a short and long semester, (b) to see the challenges that professors would face in implementing the TtR, (c) to determine the students' perspectives of the TtR. Since the TtR is a compilation of several strategies that are considered to be beneficial for students (Cross, 1981; Felder, 1993; Flint, Zakos, & Frey, 2002; Grubb, 1999; Grubb & Byrd, 1999; Kuh, Kinzie, Schuh, Whitt, & associates, 2005; Lawler, 1991; Meyers & Jones, 1993; National Research Council, 2000; Saphier & Gower, 1997; Sorcinelli, 1991; Tharp & Gallimore, 1988) we suspected that the TtR would also be beneficial. The first step in determining if the TtR was effective

involved determining whether students would recall a high percent of information over a short and long period when the TtR was implemented. Therefore, the students were not given a pretest to determine their prior knowledge nor was an experimental and control group part of the study. The lack of both are limitations of this study. If the students recall percentages were low, then we would have concluded that the TtR was ineffective or should have been restructured. Since the scores were high, our future research will include a pre-/posttest and experimental and control groups. Despite the limitations, the following provide support for the high retention rates (a) our course focused on classroom management and creating positive learning environments which are areas in which pre-service teachers are usually very weak (Fideler & Haskelhorn, 1999; Stroot et al., 1999), (b) we have a curriculum that is exclusive to this course, and (c) our class is one of the first education classes that students take in their degree plan. Therefore, we assume that the retention rates are relatively accurate given the aforementioned notions and the fact that the results occurred over multiple sections, two semesters, and both length of semesters. Future research will further investigate whether this assumption is accurate.

Regardless, the preliminary data and basic instructions about implementing the TtR suggest that this strategy may contribute to a shift in college instructional strategies toward a focus on student retention. The TtR can be used in large or small classes and with almost any subject matter. In conclusion, the TtR is significant because it provides a new direction for classroom assessment techniques and improves student retention.

References

Allen, M. S., & Roswell, B. S. (1989, March). *Self-evaluation as holistic assessment*. Paper presented at the annual meeting of the Conference on College Composition and Communication, Seattle, WA.

Almer, E. D., Jones, K., & Moeckel, C. L. (1998). The impact of one-minute papers on learning in an introductory accounting course. *Issues in Accounting Education*, *13*(3), 485-97.

Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques*. San Francisco, CA: Jossey-Bass.

Barkley, E. F., Cross, K. P., & Major, C. H. (2005). *Collaborative learning techniques: A handbook for college faculty*. San Francisco, CA: Jossey-Bass.

Barr, R.B., & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change, 27*(6), 12-25.

Bligh, D. (1998). *What's the use of lectures?* (5th ed.). Exeter: Intellect.

Cross, K. P. (1981). *Adults as learners: Increasing participation and facilitating learning*. San Francisco: Jossey-Bass.

Cross, K. P. (1998). Classroom research: Implementing the scholarship of teaching. *New Directions for Teaching and Learning,* 75(5), 5-8.

Cross, K. P., & Angelo, T. A. (1988). *Classroom assessment techniques: A handbook for*

faculty. Ann Arbor, MI: National Council for Research to Improve Postsecondary Teaching and Learning, University of Michigan.

Cross, P., & Steadman, M. (1996). *Classroom research: Implementing the scholarship of teaching*. San Francisco: Jossey-Bass.

Chizmar, J. F., & Ostrosky, A. L. (1998). The one-minute paper: Some empirical findings. *Journal of Economic Education*, *29*(1), 3-10.

Drummond, G. (2007). Programme feedback: it only takes a minute! *International Journal of Educational Management, 21*(1)*,* 29-36.

Felder, R. (1993). Reaching the second tier: Learning and teaching styles in college science education. *Journal of College Science Teaching, 23*(5), 286-290.

Fideler, E., & Haskelhorn, D. (1999). *Learning the ropes: Urban teacher induction programs and practices in the United States.* Belmont, MA: Recruiting New Teachers.

Flint, T. A., Zakos, P., & Frey, R. (2002). *Best practices in adult learning: A self-evaluation workbook for colleges and universities*. Dubuque, IA: Kendall/Hunt.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11,* 255–274.

Grubb, W. N. (1999). *Honored but invisible: An inside look at teaching in community colleges.* New York, NY: Routledge.

Grubb, W. N., & Byrd, B. (1999). Lecture/workshop and “hands-on” leaning: The complexities of occupational instruction. In W.N. Grubb and Associates, *Honored but Invisible: An Inside Look at Teaching in Community Colleges.* (pp.97-139). New York: Routledge.

Guskey, T. R. (2003). Using data to improve student achievement. *Educational Leadership, 60*(5), 6-11.

Huber, M., & Hutchings, P. (2005). *The Advancement of Learning: Building the TeachingCommons*, San Francisco: Jossey-Bass.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Kagan, S. (1994). *Cooperative learning*. San Clemente, CA: Kagan Cooperative Learning.

Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J., & Associates. (2005). *Student success in college: Creating conditions that matter.* San Francisco: Jossey-Bass.

Lammers, W.J., & Murphy, J. (2002). A profile of teaching techniques used in the university classroom. *Active Learning in Higher Education*, *3*(1), 54-67.

Lawler, P. A. (1991). *The keys to adult learning: Theory and practical strategies.* Philadelphia: Research for Better Schools.

Light, R. (1990). *Explorations with students and faculty about teaching, learning, and student life*. v. 1. Cambridge, MA: Harvard University Press.

Lotan, R.A. (2006). Managing groupwork in the heterogeneous classroom. In C. M. Evertson & C. S. Weinstein (Eds.), *Handbook of classroom management: Research, practice, and contemporary issues* (pp. 525-539). Mahwah, NJ: Lawrence Erlbaum Associates.

McGlynn, A. P. (2001). *Successful beginnings for college teaching: Engaging your students from the first day*. Madison, WI: Atwood Publishing.

Meyer, C., & Jones, T. B. (1993). *Promoting active learning: Strategies for the college classroom.* San Francisco: Jossey-Bass.

National Research Council. (2000). *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press.

Onwuegbuzie, A. J., & Teddlie, C. (2003). A framework for analyzing data in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 351–383). Thousand Oaks, CA: Sage.

Ramsden, P. (1992). *Learning to teach in higher education*. New York, NY: Routledge.

Research for Better Teachers. (1997). Instructional Strategies. In Research for Better Teachers, *Understanding teaching: Course one* (p. IS-30g). Acton, MA: Research for Better Teaching.

Richlin, L (1998). Using CATs to help new instructors develop as teachers. *New Directions for Teaching and Learning*, 75, 79-86.

Saphier, J., & Gower, R. (1997). *The skillful teacher: Building your teaching skills* (5th ed.). Acton, MA: Research for Better Teaching.

Singleton, A., & Newman, K. (2009). Empowering students to think deeply, discuss engagingly, and write definitively in the university classroom. *International Journal of Teaching and Learning in Higher Education, 20*(2), 247-250.

Sorcinelli, M. D. (1991). Research findings on the seven principles. In A. Chickering & Z. Gamson (Eds.), *Applying the seven principles for good practice in undergraduate education* (pp. 13-25). New Directions for Teaching and Learning, 47. San Francisco: Jossey-Bass.

Sousa, D. A. (2001). *How the brain learns* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Steadman, M., & Svinicki, M. (1998). A student's gateway to better learning. In T. Angelo (Ed.), *Classroom assessment and research: Uses, approaches, and research findings* (pp. 13-20). New Directions for Teaching and Learning, 75. San Francisco: Jossey-Bass.

Stroot, S., Fowlker, J., Langholz, S. Stedman, P., Steffer, L., & Valtman, A. (1999). Impact of collaborative peer assistance and review model on entry-year teachers in a large urban school setting. *Journal of Teacher Education, 50,* 27-41.

Taylor, K., Marienau, C., & Fiddler, M. (2000). *Developing adult learners: Strategies for teachers and trainers*. San Francisco: Jossey-Bass.

Tharp, R. G., & Gallimore, R. (1988). *Rousing minds to life: Teaching, learning, and schooling in social context.* New York: Cambridge University Press.

Wang, V., & Farmer, L. (2008). Adult teaching methods in China and Bloom's taxonomy. *International Journal for the Scholarship of Teaching and Learning, 2*(2). Retrieved April 15, 2010, from http://academics.georgiasouthern.edu/ijsotl/v2n2/articles/PDFs/Article_Wang_Farmer.pdf

Weaver, R. L., & Cotrell, H. W. (1985). Mental aerobics – the half sheet response. *Innovative Higher Education, 10*(1), 23–31.

Wiggins, G. P. (1998). *Educative assessment: Designing assessments to inform and improve student performance.* San Francisco: Jossey-Bass.

Wilson, R. C. (1986). Improving faculty teaching: Effective use of student evaluations and consultants. *Journal of Higher Education, 57*(2), 196-211.

Wlodkowski, R. J. (2008). *Enhancing adult motivation to learn: A comprehensive guide for teaching all adults* (3rd ed.). San Francisco: Wiley.

Appendix

Table of Exam Scores

Table A1

Distribution of Scores

		Midterm					Final				
		≤ 59	60-69	70-79	80-89	90-100	≤ 59	60-69	70-79	80-89	90-100
Summer 2009	Section 1 (*n*=15)	1	0	2	2	10	0	0	3	6	6
	Section 2 (*n*=19)	2	0	3	6	8	0	0	3	6	10
Fall 2009	Section 11 (*n*=4)	0	1	1	2	0	0	0	0	3	1
	Section 12 (*n*=11)	0	1	1	2	7	0	0	2	4	5
	Section 13 (*n*=10)	0	0	1	2	7	0	0	2	4	4